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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,717	02/26/2002	Radha Setty	967AG	4766

7590 10/23/2003
Kevin Redmond
6960 SW Gator Trail
Palm City, FL 34990

EXAMINER

SOWARD, IDA M

ART UNIT	PAPER NUMBER
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2822

DATE MAILED: 10/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/082,717

Applicant(s)

SETTY ET AL.

Examiner

Ida M Soward

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mw

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 and 24-33 is/are rejected.
- 7) ☒ Claim(s) 4,34 and 35 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 February 2002 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- ☐ Interview Summary (PTO-413) Paper No(s). _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

This Office Action is in response to the election filed July 31, 2003.

Priority

This application filed under former 37 CFR 1.60 lacks the necessary reference to the prior application. A statement reading "This is a provisional of Application No. 60/292,440, filed 05/22/2001." should be entered following the title of the invention or as the first sentence of the specification.

Drawings

Figure 1 should be designated by a legend such as --**Prior Art**-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

Claim 4 is objected to because of the following informalities: a period "." should have followed "**substrate**". Appropriate correction is required.

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art Figure 1 in view of Cygan et al. (5,015,972) and Abel (US 6,198,374 B1).

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Admitted Prior Art Figure 1 teaches a coupler 20 comprising: a resistor R; a capacitor C; a ground plane, wherein the capacitor has one electrode formed on one layer and a ground plane formed on another layer; and a transformer 30. However, Admitted Prior Art Figure 1 fails to teach a substrate having a plurality of layers and a plurality of vias. Cygan et al. teach a substrate having a plurality of layers (Figure 1a, cols. 2-3, lines 23-68 and 1-30, respectively). Abel teaches a plurality of vias 119a-125d extending between the layers (Figure 1, col. 4, lines 37-64). Since Admitted Prior Art Figure 1, Cygan et al. and Abel are from the same field of endeavor (transformer containing structures), the purpose disclosed by Abel would have been recognized in the pertinent art of Admitted Prior Art Figure 1 and Cygan et al. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention to modify the directional coupler of Admitted Prior Art Figure 1 by incorporating the substrate of Cygan et al. and the vias of Abel to improve magnetic coupling and dielectric breakdown voltage between windings (col. 1, lines 6-9).

Claims 2, 9-12 and 24-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art Figure 1, Cygan et al. (5,015,972) and Abel (US 6,198,374 B1) as applied to claim 1 above, and further in view of Lillo et al. (US 2002/0175775 A1).

Admitted Prior Art Figure 1, Cygan et al. and Abel teach all mentioned in the rejection above. Admitted Prior Art Figure 1 further teaches a coupler for providing coupling between an input port and a coupled port, the coupler having an output port

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and a terminated port; the resistor electrically connected between the transformer and a ground; and the capacitor electrically connected between the transformer and a ground.

Cygan et al. and Abel further teach multi-layered substrates having top and bottom surfaces (Figures 1a and 1, respectively). Abel further teaches a transformer attached to the upper surface and electrically connected to the first terminals; a plurality of vias extending through the substrate for providing an electrical connection between the first terminals and the second terminals; and a ground plane formed on the substrate electrically connected between the transformer and a ground (Figure 1). However, Admitted Prior Art Figure 1, Cygan et al. and Abel fail to teach low temperature co-fired ceramic. Lillo et al. teach low temperature co-fired ceramic (page 1, paragraph [0006]); and a plurality of first terminal located on the top surface and a plurality of second terminals located on the bottom surface (Figures 6-8). Since Admitted Prior Art Figure 1, Cygan et al., Abel and Lillo et al. are from the same field of endeavor (transformer containing structures), the purpose disclosed by Lillo et al. would have been recognized in the pertinent art of Admitted Prior Art Figure 1, Cygan et al. and Abel. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention to modify the directional coupler of Admitted Prior Art Figure 1, the substrate of Cygan et al. and the vias of Abel by incorporating the low temperature co-fired ceramic of Lillo et al. to achieve high density and low volume (page 1, paragraph [0002]).

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Claims 3-6 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art Figure 1, Cygan et al. (5,015,972) and Abel (US 6,198,374 B1) as applied to claim 1 above, and further in view of Cain et al. (6,114,924).

Admitted Prior Art Figure 1, Cygan et al. and Abel teach all mentioned in the rejection above. Abel further teaches a plurality of terminals located on an upper layer; and windings electrically connected to terminals by a plurality of welds 116 (Figure 1). However, Admitted Prior Art Figure 1, Cygan et al. and Abel fail to teach a transformer having a binocular core and a plurality of windings. Cain et al. teach a transformer having a binocular core and a plurality of windings, wherein the transformer is attached to the substrate (Figures 3-4, col. 3, lines 24-67). Since Admitted Prior Art Figure 1, Cygan et al., Abel and Cain et al. are from the same field of endeavor (transformer containing structures), the purpose disclosed by Cain et al. would have been recognized in the pertinent art of Admitted Prior Art Figure 1, Cygan et al. and Abel. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention to modify the directional coupler of Admitted Prior Art Figure 1, the substrate of Cygan et al. and the vias of Abel by incorporating the binocular core of Cain et al. to provide a coupler that has high return loss (col. 2, lines 19-22).

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art Figure 1, Cygan et al. (5,015,972), Abel (US 6,198,374 B1) and Lillo et al. (US 2002/0175775 A1) as applied to claims 1-2, 9-12 and 24-32 above, and further in view of Cain et al. (6,114,924).

Admitted Prior Art Figure 1, Cygan et al., Abel and Lillo et al. teach all mentioned in the rejection above. However, Admitted Prior Art Figure 1, Cygan et al., Abel and Lillo et al. fail to teach a transformer having a binocular core and a plurality of windings. Cain et al. teach a transformer having a binocular core and a plurality of windings, wherein the transformer is attached to the substrate (Figures 3-4, col. 3, lines 24-67). Since Admitted Prior Art Figure 1, Cygan et al., Abel, Lillo et al. and Cain et al. are from the same field of endeavor (transformer containing structures), the purpose disclosed by Cain et al. would have been recognized in the pertinent art of Admitted Prior Art Figure 1, Cygan et al., Abel and Lillo et al. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention to modify the directional coupler of Admitted Prior Art Figure 1, the substrate of Cygan et al., the vias of Abel and the low temperature co-fired ceramic of Lillo et al. by incorporating the binocular core of Cain et al. to provide excellent impedance matching (col. 1, lines 61-63).

Claims 7 and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art Figure 1, Cygan et al. (5,015,972), Abel (US 6,198,374 B1) and Lillo et al. (US 2002/0175775 A1) as applied to claims 1-2, 9-12 and 24-32 above, and further in view of Street (4,538,346).

Admitted Prior Art Figure 1, Cygan et al., Abel and Lillo et al. teach all mentioned in the rejection above. However, Admitted Prior Art Figure 1, Cygan et al., Abel and Lillo et al. fail to teach a transformer attached to the substrate using an epoxy and a solder reflow paste. Street teaches a transformer attached to the substrate using an epoxy and a

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solder reflow paste (Figure 6, col. 5, lines 5-12). Since Admitted Prior Art Figure 1, Cygan et al., Abel, Lillo et al. and Cain et al. are from the same field of endeavor (transformer containing structures), the purpose disclosed by Cain et al. would have been recognized in the pertinent art of Admitted Prior Art Figure 1, Cygan et al., Abel and Lillo et al. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention to modify the directional coupler of Admitted Prior Art Figure 1, the substrate of Cygan et al., the vias of Abel and the low temperature co-fired ceramic of Lillo et al. by incorporating the epoxy and reflow solder of Street to cut costs (col. 1, lines 38-45).

Allowable Subject Matter

Claims 34-35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to directional couplers:

Apel (4,467,293)

Zheng (6,140,887).

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ida M Soward whose telephone number is 703-305-3308. The examiner can normally be reached on Monday - Thursday, 6:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 703-308-4905. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

ims
October 15, 2003



AMIR ZARABIAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800